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BOX PATENT APPLICATION  
Assistant Commissioner for Patents  
Washington, D.C. 20231

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of:

Kenneth N. Raymond, et al.

Divisional of Application  
No.: 09/507,630

Filed: February 18, 2000

For: PHTHALAMIDE-LANTHANIDE  
COMPLEXES FOR USE AS  
LUMINESCENT MARKERS

Examiner: Ceperley, M.

Art Unit: 1641

PRELIMINARY AMENDMENT

BOX PATENT APPLICATION  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to examination of the above-referenced application, please enter the following amendments and remarks.

IN THE SPECIFICATION:

At page 1, paragraph 1, please delete paragraph (lines 5-11) and replace it with the following:

**CROSS-REFERENCES TO RELATED APPLICATIONS**

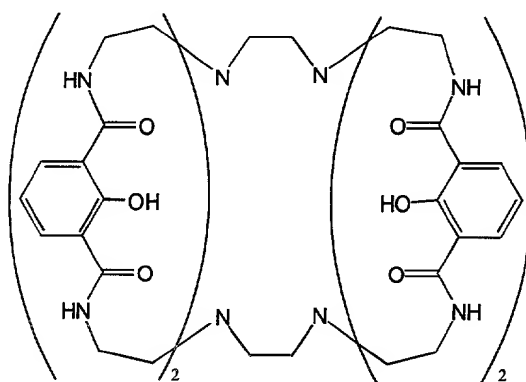
This application is a divisional of and claims the benefit of U.S. Application No. 09/507,630, filed February 18, 2000, which claims the benefit of U.S. Provisional Application No. 60/120,881, filed February 18, 1999, the disclosures of both of which are incorporated herein by reference, in their entirety for all purposes.

**IN THE CLAIMS:**

Please cancel claims 1-4 and 64-123. A copy of the pending claims are attached in the Appendix of this Amendment for the Examiner's convenience.

Claim 63 has been amended to correct punctuation. A period has been added to the end of the sentence.

63. (Amended) The compound according to claim 49, having a structure according to Formula XIV:



(XIV).

**REMARKS**

**Status of the Claims**

Claims 5-63 are pending.

Claims 1-123 were filed in the parent (U.S. Application No. 09/507,630) of the present divisional application. In response to the Election of Species Requirement mailed on January 19, 2001, Applicants elected Group I (claims 1-4) for prosecution in the parent application, canceling the remaining claims.


The claims presented for examination in this division are directed to the species of Group II, which were not elected in the parent.

**CONCLUSION**

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



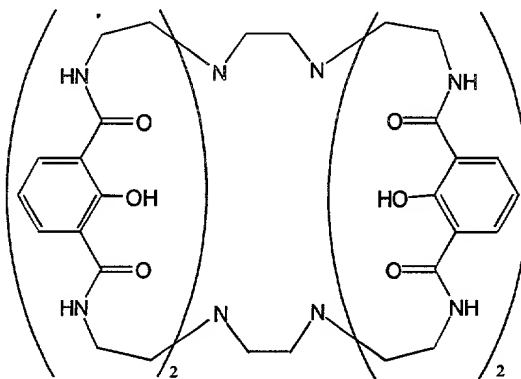
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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

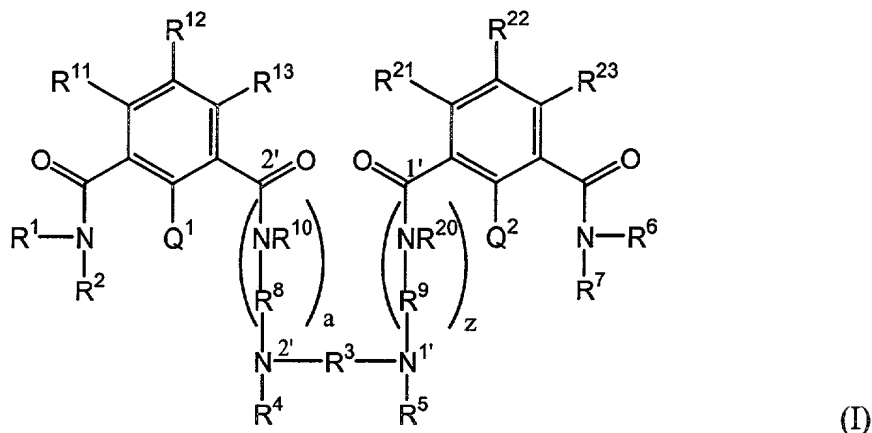
- 1                    63.    (Amended) The compound according to claim 49, having a structure  
2    according to Formula XIV:



(XIV).

CLAIMS PENDING AFTER AMENDMENT

5. A compound having a structure according to Formula I:



wherein,

$R^1, R^2, R^4, R^5, R^6, R^7, R^{10}$  and  $R^{20}$  are members independently selected from the group consisting of H, alkyl and substituted alkyl groups,

wherein, two or more of  $R^2, R^4, R^5, R^7$  and, when  $R^3$  is substituted alkyl, a substituent of  $R^3$  are optionally adjoined by at least one linker moiety to form at least one ring;

$R^3, R^8$  and  $R^9$  are members independently selected from the group consisting of alkyl, substituted alkyl, aryl and substituted aryl groups;

$R^{11}, R^{12}, R^{13}, R^{21}, R^{22}$  and  $R^{23}$  are members independently selected from alkyl, substituted alkyl, H,  $-\text{NR}^{14}\text{R}^{15}$ ,  $-\text{NO}_2$ ,  $-\text{OR}^{16}$ ,  $-\text{COOR}^{17}$ ,

wherein,  $R^{14}, R^{15}, R^{16}$  and  $R^{17}$  are members independently selected from the group consisting of H, alkyl and substituted alkyl, wherein  $R^{12}$  can optionally form a ring with  $R^{11}, R^{13}$  or both, and  $R^{22}$  can optionally form a ring with  $R^{21}, R^{23}$  or both, said rings being members independently selected from the group of ring systems consisting of cyclic alkyl, substituted cyclic alkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, heterocyclyl and saturated heterocyclyl ring systems; and

$Q^1$  is  $-\text{OR}^{18}$ ;

$Q^2$  is  $-\text{OR}^{19}$ ,

wherein  $R^{18}$  and  $R^{19}$  are members independently selected from H, an enzymatically labile group, a hydrolytically labile group and a single negative charge;  
 a is 0 or 1, with the proviso that when a is 0,  $N^{2'}$  is covalently attached directly to carbonyl group 2'.  
 z is 0 or 1, with the proviso that when z is 0,  $N^{1'}$  is covalently attached directly to carbonyl group 1'.

6. The compound according to claim 4, wherein z is 0.

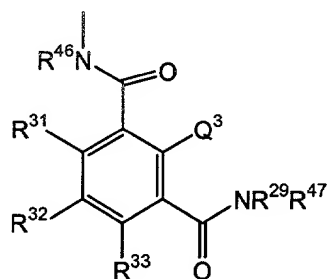
7. The compound according to claim 5, wherein  $R^3$  is a linear  $C_1-C_6$  hydrocarbon.

8. The compound according to claim 6, wherein

$R^8$  is  $(CH_2)_p$ ;

$R^4$  is an alkyl group substituted with a moiety having a structure according to

Formula II:



(II)

wherein,

$R^{29}$ ,  $R^{46}$  and  $R^{47}$  are members independently selected from the group consisting of H, alkyl and substituted alkyl groups, wherein, two or more of  $R^2$ ,  $R^7$  and  $R^{29}$  are optionally adjoined by at least one linker moiety to form at least one ring

$R^{31}$ ,  $R^{32}$  and  $R^{33}$  are members independently selected from alkyl, substituted alkyl, H,  $-NR^{24}R^{25}$ ,  $-NO_2$ ,  $-OR^{26}$ ,  $-COOR^{27}$ ,

wherein,  $R^{24}$ ,  $R^{25}$ ,  $R^{26}$  and  $R^{27}$  are members independently selected from the group consisting of H, alkyl and substituted alkyl, wherein  $R^{32}$  can

optionally form a ring with  $R^{31}$ ,  $R^{33}$  or both, said rings being members independently selected from the group of ring systems consisting of cyclic alkyl, substituted cyclic alkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, heterocyclyl and saturated heterocyclyl ring systems;

$R^3$  is  $(CH_2)_x$ ;

$Q^3 - OR^{28}$ , wherein  $R^{28}$  is a member selected from H, an enzymatically labile group, a hydrolytically labile group and a single negative charge;

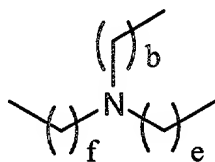
P and X are members independently selected from the group consisting of the integers from 1 to 5, inclusive;

and z is 0.

9. The compound according to claim 8, wherein two or more of  $R^2$ ,  $R^7$  and  $R^{29}$  are adjoined by at least one linker moiety to form at least one ring.

10. The compound according to claim 8, wherein  $R^2$ ,  $R^6$  and  $R^{29}$  together comprise a single linker moiety.

11. The compound according to claim 10, wherein said linker moiety has a structure according to Formula III :

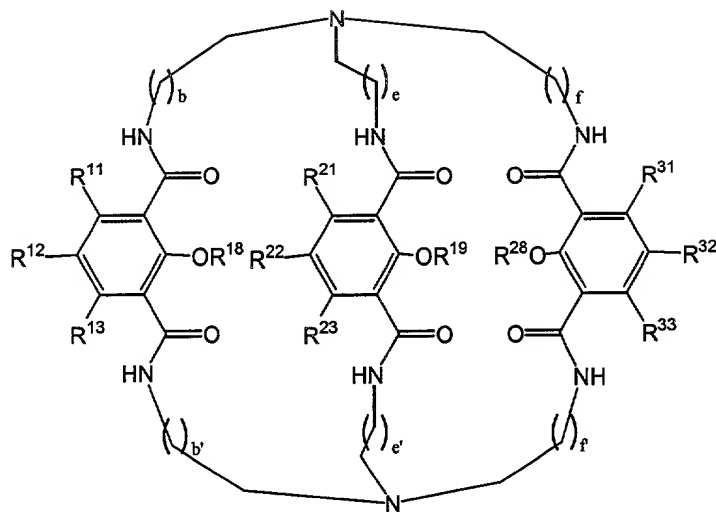


(III)

wherein,

b, e and f are members independently selected from the group consisting of the integers from 1 to 5, inclusive.

12. A compound according to claim 11, having a structure according to Formula IV:



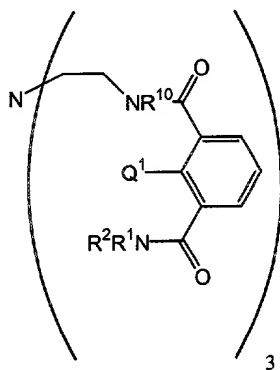
(IV)

wherein,

b, b', e, e', f and f' are members independently selected from the group consisting of the integers from 1 to 5, inclusive.

13. A compound according to claim 8, having a structure according to

Formula V:

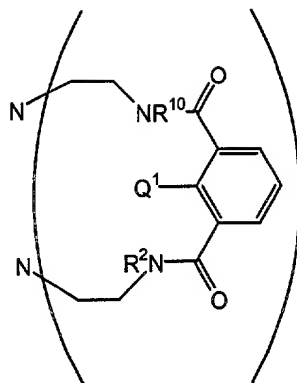


(V).

14. The compound according to claim 13, having a structure according to

Formula VI:





(VI).

15. The compound according to claim 8 wherein,  $R^1, R^2, R^3, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{29}, R^{46}$  and  $R^{47}$  are members independently selected from the group consisting of H,  $C_1$  to  $C_{10}$  alkyl and  $C_1$  to  $C_{10}$  substituted alkyl.

16. The compound according to claim 15 wherein,  $R^1, R^2, R^3, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{29}, R^{46}$  and  $R^{47}$  are members independently selected from the group consisting of H,  $C_2$  to  $C_6$  alkyl and  $C_2$  to  $C_6$  substituted alkyl.

17. The compound according to claim 8, wherein  $R^1, R^2, R^3, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{29}, R^{46}$  and  $R^{47}$  are members independently selected from the group consisting of H, aryl, substituted aryl and combinations thereof.

18. The compound according to claim 8, wherein  $R^1, R^2, R^3, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{29}, R^{46}$  and  $R^{47}$  are members independently selected from the group consisting of H and alkyl substituted with polycyclic aryl groups.

19. The compound according to claim 8, wherein a member selected from the group consisting of  $R^1, R^2, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{29}, R^{46}$  and  $R^{47}$  and combinations thereof is a primary alkyl amine.

20. The compound according to claim 19, wherein said primary alkyl amine is a  $C_1$  to  $C_{10}$  alkyl chain bearing an amine moiety at the  $\omega$ -position.

21. The compound according to claim 20, wherein said primary alkyl amine as a  $C_2$  to  $C_6$  alkyl chain bearing an amine moiety at the  $\omega$ -position.

22. The compound according to claim 8, wherein a member selected from the group consisting of  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$ ,  $R^9$ ,  $R^{10}$ ,  $R^{29}$ ,  $R^{46}$  and  $R^{47}$  and combinations thereof is a polyether.

23. The compound according to claim 22, wherein said polyether is a member selected from ethylene glycol, ethylene glycol oligomers and combinations thereof, wherein said polyether has a molecular weight of from about 60 daltons to about 10,000 daltons.

24. The compound according to claim 23, wherein said polyether has a molecular weight of from about 100 daltons to about 1,000 daltons.

25. The compound according to claim 8, wherein a member selected from the group consisting of  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$ ,  $R^9$ ,  $R^{10}$ ,  $R^{29}$ ,  $R^{46}$  and  $R^{47}$  comprise a reactive group for conjugating said compound to a member selected from the group consisting of molecules and surfaces.

26. The compound according to claim 8, wherein  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^8$ ,  $R^9$ ,  $R^{10}$ ,  $R^{29}$ ,  $R^{46}$  and  $R^{47}$  and combinations thereof are members selected from  $\omega$ -carboxyl alkyl groups,  $\omega$ -carboxyl substituted alkyl groups and combinations thereof.

27. The compound according to claim 26, wherein said  $\omega$ -carboxyl substituted alkyl group has a structure according to Formula VII:



wherein,

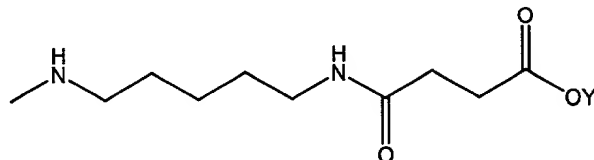
X is a member selected from O, S and  $NR^{50}$ , wherein

$R^{50}$  is a member selected from H, alkyl and substituted alkyl;

Y is a member selected from H and a single negative charge; and

j and k are members independently selected from the group consisting of integers from 1 to 18.

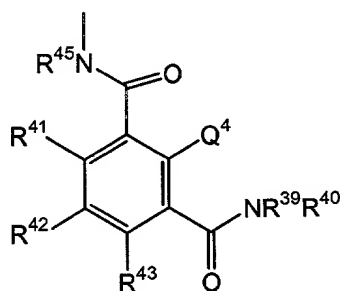
28. The compound according to claim 27, wherein said  $\omega$ -carboxyl substituted alkyl group has a structure according to Formula VIII:



(VIII).

29. The compound according to claim 8, wherein  $R^1$ ,  $R^2$ ,  $R^5$ ,  $R^6$ ,  $R^7$ ,  $R^{10}$ ,  $R^{29}$ ,  $R^{46}$  and  $R^{47}$  are H.

30. The compound according to claim 5, wherein  $R^4$  is an alkyl group substituted with a group having a structure according to Formula II;  
 $R^5$  is an alkyl group substituted with a moiety having a structure according to Formula IX:



(IX)

wherein,

$R^{39}$ ,  $R^{40}$  and  $R^{45}$  are members independently selected from alkyl and substituted alkyl groups; and

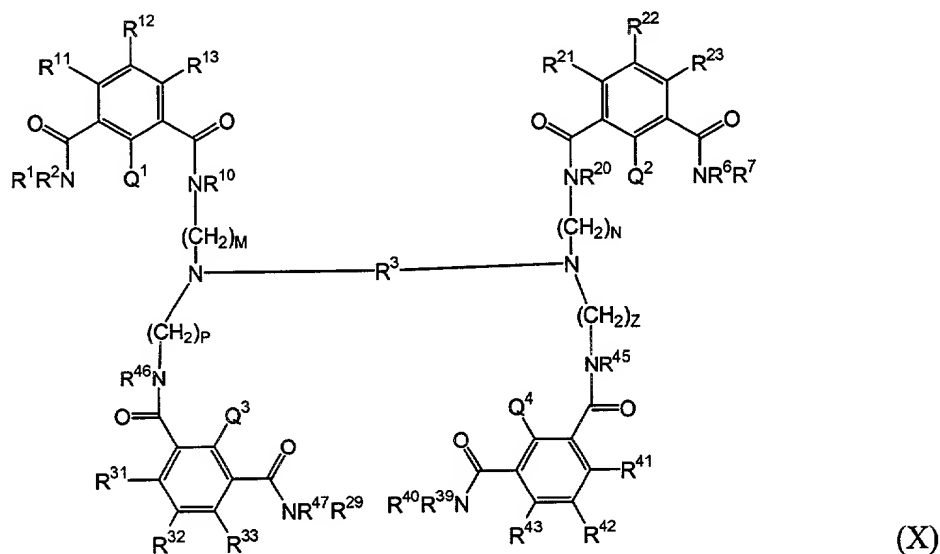
$R^{41}$ ,  $R^{42}$  and  $R^{43}$  are members independently selected from alkyl, substituted alkyl, H,  $-\text{NR}^{34}\text{R}^{35}$ ,  $-\text{NO}_2$ ,  $-\text{OR}^{36}$ ,  $-\text{COOR}^{37}$ ,

wherein,  $R^{34}$ ,  $R^{35}$ ,  $R^{36}$  and  $R^{37}$  are members independently selected from the group consisting of H, alkyl and substituted alkyl, wherein  $R^{42}$  can optionally form a ring with  $R^{41}$ ,  $R^{43}$  or both, said rings being members independently selected from the group of ring systems consisting of cyclic alkyl, substituted cyclic alkyl, aryl, substituted aryl, heteroaryl,

substituted heteroaryl, heterocyclyl and saturated heterocyclyl ring systems.

31. A compound according to claim 30, having a structure according to

Formula X:



wherein,

M, N, P and Z are members independently selected from the group consisting of the integers between 1 and 5, inclusive.

32. The compound according to claim 31, wherein,  $R^1, R^2, R^3, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{20}, R^{29}, R^{39}, R^{40}, R^{45}, R^{46}$  and  $R^{47}$  are members independently selected from the group consisting of  $C_1$  to  $C_{10}$  alkyl and  $C_1$  to  $C_{10}$  substituted alkyl.

33. The compound according to claim 32 wherein,  $R^1, R^2, R^3, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{20}, R^{29}, R^{39}, R^{40}, R^{45}, R^{46}$  and  $R^{47}$  are members independently selected from the group consisting of  $C_2$  to  $C_6$  alkyl and  $C_2$  to  $C_6$  substituted alkyl.

34. The compound according to claim 31, wherein  $R^1, R^2, R^3, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{20}, R^{29}, R^{39}, R^{40}, R^{45}, R^{46}$  and  $R^{47}$  are members independently selected from the group consisting of aryl, substituted aryl and combinations thereof.

1                   35.     The compound according to claim 31, wherein  $R^1, R^2, R^3, R^5, R^6, R^7,$   
2      $R^8, R^9, R^{10}, R^{20}, R^{29}, R^{39}, R^{40}, R^{45}, R^{46}$  and  $R^{47}$  are members independently selected from the  
3     group consisting of alkyl substituted with polycyclic aryl groups.

1                   36.     The compound according to claim 31, wherein a member selected  
2     from the group consisting of  $R^1, R^2, R^5, R^6, R^7, R^8, R^9, R^{10}, R^{20}, R^{29}, R^{39}, R^{40}, R^{45}, R^{46}$  and  
3      $R^{47}$  and combinations thereof is a primary alkyl amine.

1                   37.     The compound according to claim 31, wherein said primary alkyl  
2     amine as a  $C_1$  to  $C_{10}$  alkyl chain bearing an amine moiety at the  $\omega$ -position.

1                   38.     The compound according to claim 37, wherein said primary alkyl  
2     amine as a  $C_2$  to  $C_6$  alkyl chain bearing an amine moiety at the  $\omega$ -position.

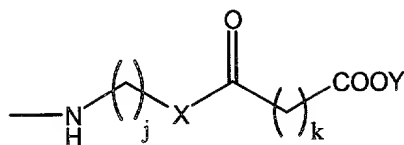
1                   39.     The compound according to claim 31, wherein a member selected  
2     from the group consisting of  $R^1, R^2, R^6, R^7, R^{10}, R^{20}, R^{29}, R^{39}, R^{40}, R^{45}, R^{46}$  and  $R^{47}$  and  
3     combinations thereof is a polyether.

1                   40.     The compound according to claim 39, wherein said polyether is a  
2     member selected from ethylene glycol, ethylene glycol oligomers and combinations thereof,  
3     wherein said polyether has a molecular weight of from about 60 daltons to about 10,000  
4     daltons.

1                   41.     The compound according to claim 39, wherein said polyether has a  
2     molecular weight of from about 100 daltons to about 1,000 daltons.

1                   42.     The compound according to claim 31, wherein  $R^1, R^2, R^6, R^7, R^{10}, R^{20},$   
2      $R^{29}, R^{39}, R^{40}, R^{45}, R^{46}$  and  $R^{47}$  and combinations thereof are members selected from  $\omega$ -  
3     carboxyl alkyl groups,  $\omega$ -carboxyl substituted alkyl groups and combinations thereof.

1                   43.     The compound according to claim 42, wherein said  $\omega$ -carboxyl  
2     substituted alkyl group has a structure according to Formula VII:



(VII)

wherein,

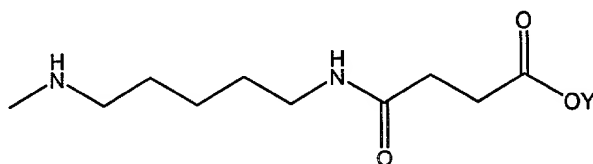
X is a member selected from O, S and  $\text{NR}^{50}$ , wherein

$\text{R}^{50}$  is a member selected from H, alkyl and substituted alkyl;

Y is a member selected from H and a single negative charge; and

j and k are members independently selected from the group consisting of integers from 1 to 18.

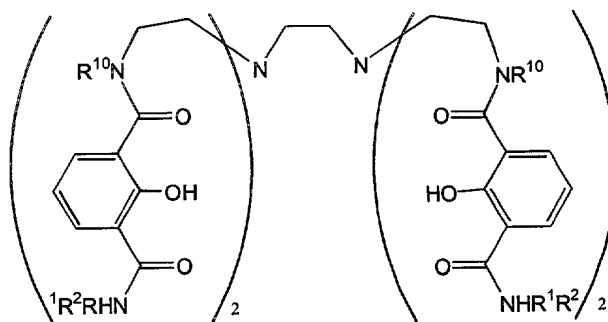
44. The compound according to claim 43, wherein said  $\omega$ -carboxyl substituted alkyl group has a structure according to Formula VIII:



(VIII).

45. The compound according to claim 31, wherein  $\text{R}^1$ ,  $\text{R}^2$ ,  $\text{R}^6$ ,  $\text{R}^7$ ,  $\text{R}^{10}$ ,  $\text{R}^{20}$ ,  $\text{R}^{29}$ ,  $\text{R}^{39}$ ,  $\text{R}^{40}$ ,  $\text{R}^{45}$ ,  $\text{R}^{46}$  and  $\text{R}^{47}$  are H.

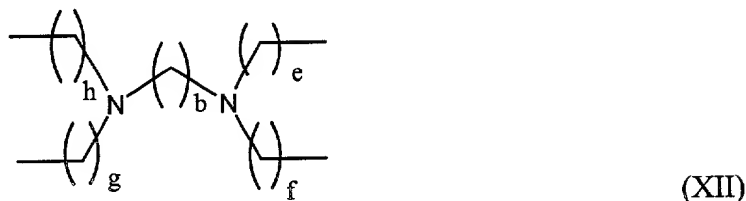
46. A compound according to claim 31, having a structure according to Formula XI:



(XI).

47. The compound according to claim 30, wherein  $\text{R}^1$ ,  $\text{R}^6$ ,  $\text{R}^{29}$  and  $\text{R}^{39}$  together comprise a single linker moiety.

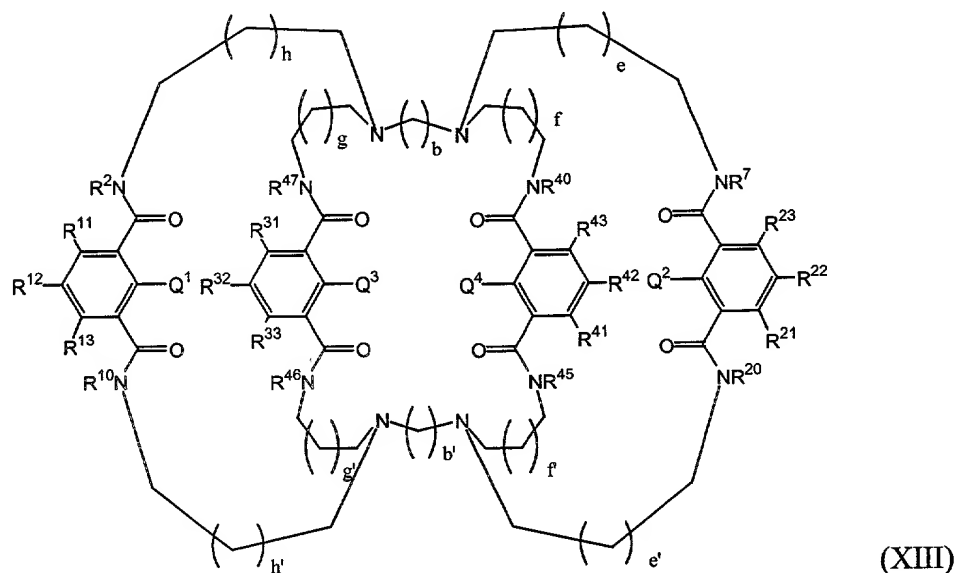
48. The compound according to claim 47, wherein said single linker moiety has a structure according to Formula XII:



wherein,

b, e, f, g and h are members independently selected from the numbers between 1 and 5, inclusive.

49. A compound according to claim 48, having a structure according to Formula XIII:



wherein,

$R^2, R^7, R^{10}, R^{20}, R^{40}, R^{45}, R^{46}$ , and  $R^{47}$  are members independently selected from the group consisting of H, alkyl and substituted alkyl;

$R^{11}, R^{12}, R^{13}, R^{21}, R^{22}, R^{23}, R^{31}, R^{32}, R^{33}, R^{41}, R^{42}$  and  $R^{43}$  are members independently selected from alkyl, substituted alkyl, H,  $-NR^{10}R^{11}$ ,  $-NO_2$ ,  $-OR^{12}$ ,  $-COOR^{13}$ , or two or more of  $R^5, R^6$  and  $R^7$  are joined to form a ring system, which is a member selected from cyclic alkyl, substituted cyclic alkyl,

11 aryl, substituted aryl, heteroaryl, substituted heteroaryl, heterocyclyl and  
12 saturated heterocyclyl systems;  
13  $Q^1$ ,  $Q^2$ ,  $Q^3$  and  $Q^4$  are  $OR^{18}$ ,  $OR^{19}$ ,  $OR^{28}$ ,  $OR^{38}$ , respectively, wherein,  $R^{18}$ ,  $R^{19}$ ,  
14  $R^{28}$  and  $R^{38}$  are members independently selected from H, and a single negative  
15 charge;  
16 b and b' are members independently selected from the group consisting of the  
17 integers from 1 to 5, inclusive; and  
18 e, e', f, f', g, g', h and h' are members independently selected from the group  
19 consisting of numbers from 0 to 3.

1 50. The compound according to claim 49 wherein,  $R^2$ ,  $R^7$ ,  $R^{10}$ ,  $R^{20}$ ,  $R^{40}$ ,  
2  $R^{45}$ ,  $R^{46}$ , and  $R^{47}$  are members independently selected from the group consisting of  $C_1$  to  $C_{10}$   
3 alkyl and  $C_1$  to  $C_{10}$  substituted alkyl.

1 51. The compound according to claim 50 wherein,  $R^2$ ,  $R^7$ ,  $R^{10}$ ,  $R^{20}$ ,  $R^{40}$ ,  
2  $R^{45}$ ,  $R^{46}$ , and  $R^{47}$  are members independently selected from the group consisting of  $C_2$  to  $C_6$   
3 alkyl and  $C_2$  to  $C_6$  substituted alkyl.

1 52. The compound according to claim 49, wherein  $R^2$ ,  $R^7$ ,  $R^{10}$ ,  $R^{20}$ ,  $R^{40}$ ,  
2  $R^{45}$ ,  $R^{46}$ , and  $R^{47}$  are members independently selected from the group consisting of aryl,  
3 substituted aryl and combinations thereof.

1 53. The compound according to claim 52, wherein  $R^2$ ,  $R^7$ ,  $R^{10}$ ,  $R^{20}$ ,  $R^{40}$ ,  
2  $R^{45}$ ,  $R^{46}$ , and  $R^{47}$  are members independently selected from the group consisting of alkyl  
3 substituted with polycyclic aryl groups.

1 54. The compound according to claim 49, wherein a member selected  
2 from the group consisting of  $R^2$ ,  $R^7$ ,  $R^{10}$ ,  $R^{20}$ ,  $R^{40}$ ,  $R^{45}$ ,  $R^{46}$ , and  $R^{47}$  and combinations thereof  
3 is a primary alkyl amine.

1 55. The compound according to claim 54, wherein said primary alkyl  
2 amine as a  $C_1$  to  $C_{10}$  alkyl chain bearing an amine moiety at the  $\omega$ -position.



1           **56.**    The compound according to claim 55, wherein said primary alkyl  
2 amine as a C<sub>2</sub> to C<sub>6</sub> alkyl chain bearing an amine moiety at the ω-position.

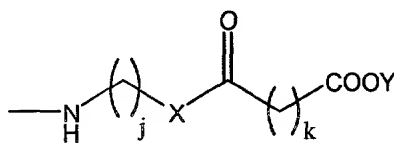
1           **57.**    The compound according to claim 49, wherein a member selected  
2 from the group consisting of R<sup>2</sup>, R<sup>7</sup>, R<sup>10</sup>, R<sup>20</sup>, R<sup>40</sup>, R<sup>45</sup>, R<sup>46</sup>, and R<sup>47</sup> and combinations thereof  
3 is a polyether.

1           **58.**    The compound according to claim 57, wherein said polyether is a  
2 member selected from ethylene glycol, ethylene glycol oligomers and combinations thereof,  
3 wherein said polyether has a molecular weight of from about 60 daltons to about 10,000  
4 daltons.

1           **59.**    The compound according to claim 58, wherein said polyether has a  
2 molecular weight of from about 100 daltons to about 1,000 daltons.

1           **60.**    The compound according to claim 49, wherein R<sup>2</sup>, R<sup>7</sup>, R<sup>10</sup>, R<sup>20</sup>, R<sup>40</sup>,  
2 R<sup>45</sup>, R<sup>46</sup>, and R<sup>47</sup> and combinations thereof are members selected from ω-carboxyl alkyl  
3 groups, ω-carboxyl substituted alkyl groups and combinations thereof.

1           **61.**    The compound according to claim 60, wherein said ω-carboxyl  
2 substituted alkyl group has a structure according to Formula VII:



(VII)

4           wherein,

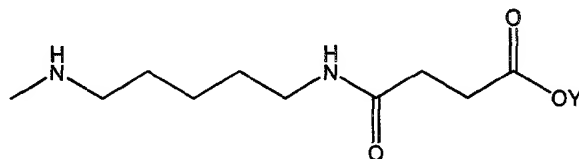
5           X is a member selected from O, S and NR<sup>50</sup>, wherein

6           R<sup>50</sup> is a member selected from H, alkyl and substituted alkyl;

7           Y is a member selected from H and a single negative charge; and

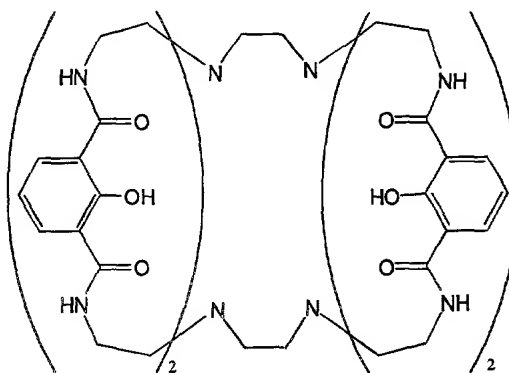
8           j and k are members independently selected from the group consisting of integers  
9           from 1 to 18.

- 1                    **62.**    The compound according to claim 61, wherein said  $\omega$ -carboxyl  
2 substituted alkyl group has a structure according to Formula VIII:



(VIII).

- 1                    **63.**    (Amended) The compound according to claim 49, having a structure  
2 according to Formula XIV:



(XIV).